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APPENDIX D

ECOLOGICAL RISK ASSESSMENT

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**LEVEL I SCOPING ECOLOGICAL RISK
ASSESSMENT
KINDER MORGAN LINNTON TERMINAL**

October 2002

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1.0 INTRODUCTION

This report presents the findings and conclusions of a Level I Scoping Ecological Risk Assessment (ERA) conducted for Kinder Morgan Liquid Terminals, LLC (KMLT) at the Linnton Terminal in Linnton, Multnomah County, Oregon (Figure 1).

This Level I Scoping Ecological Risk Assessment was conducted in accordance with Oregon Department of Environmental Quality (ODEQ) Guidance. The completed ODEQ Level I ERA Attachments 1 and 2 are presented in Appendices A and B. A Level I Scoping ERA is a conservative qualitative determination of whether there is any reason to believe ecological receptors and/or exposure pathways are present or potentially present at or in the locality of the facility (ODEQ 1998).

2.0 ASSESSMENT OF EXISTING DATA

KHM Environmental Management, Inc. (KHM) produced a Remedial Investigation (RI) Work Plan in October 2001. The background information in the RI Work Plan document that pertains to this Level I Scoping ERA is summarized below.

2.1 SITE LOCATION

The subject property, known as the Linnton Terminal, consists of two lots, one approximately 15.97 acres and the other approximately 0.13 acres in size. The site is located in Linnton, Multnomah County, Oregon, between Northwest St. Helens Road (U.S. 30) to the west and the Willamette River to the east. The site is geographically located within Section 3, Township 1 North, Range 1 West, Willamette Meridian (Figure 1).

The immediately adjacent properties are depicted on Figure 2 and are described as follows:

- *North:* The former Kingsley Lumber and Linnton Planing Mill, now owned by Owens Corning.
- *East:* Willamette River.
- *South:* The former Clark and Wilson Lumber, the former West Coast Adhesives (now vacant), private residences.
- *West:* Portland & Western Railroad, rail spur to rail car loading racks on site, Olympic Pipeline Company transfer station, commercial properties including a Texaco gas station, two convenience stores, and a cafe.

2.2 SITE HISTORY SUMMARY

The facility was originally developed and operated by Grace Steamship Lines in 1903 to store fuel oil. Tidewater gained possession of the terminal in 1937 through a merger with Grace. Phillips purchased the site in 1966 and sold it to GATX Terminals Corporation in 1974. The terminal was owned and operated by GATX until March 2001, when Kinder Morgan Energy Partners (KMEP) purchased the facility. KMLT, KMEP's operating partner, currently operates the terminal.

A comprehensive description of site history is included in the RI Work Plan (KHM 2001), and will be included in the forthcoming RI report.

2.3 CURRENT AND REASONABLY LIKELY FUTURE SITE LAND AND WATER USE

The site is currently used for storage and transfer of refined petroleum products, including gasoline, diesel, and lubrication oils. The terminal consists of 34 petroleum tanks connected via a piping system to the Olympic Pipeline, SFPP LP Pipeline, truck and rail car loading racks, and the dock used to transfer product to and from barges and ships.

Approximately 90 percent of the site is covered with concrete pavement, buildings, tanks, and gravel surfacing. The vacant lot at the southwest corner consists of soil with some sandblast grit. Less than one percent of the site is covered with vegetation, with only sparse individual trees, shrubs, and grasses growing along the shoreline of the river and along the perimeter of the site.

Stormwater is processed through an oil-water separator (OWS) system, which flows to a batch tank. The tank is batch sampled for compliance with National Pollution Discharge Elimination System (NPDES) discharge limits and is discharged, in compliance with the NPDES permit, to the Willamette River.

The City of Portland Water Bureau supplies potable water. There are no known historic or currently used domestic drinking water wells on the site.

The most likely foreseeable land use at the site is heavy industrial use as a bulk fuel terminal. Future water use is likely to be limited to industrial applications and the support of aquatic habitat. The City of Portland Water Bureau will continue to supply drinking water. Additional information about likely future beneficial water use is provided in the RI (KHM 2002). Future groundwater extraction for industrial purposes is unlikely.

2.4 SENSITIVE ENVIRONMENTS/THREATENED AND/OR ENDANGERED SPECIES

A sensitive environment, as defined in OAR 340-122-0115, is an "area of particular environmental value where a hazardous substance could pose a greater threat than in other non-sensitive areas" (ODEQ 2002). Sensitive environments may include critical habitats, national parks, state parks, wildlife refuges, marine sanctuaries, wilderness areas, and other significant open spaces. The 16.1-acre site does not contain sensitive environments under this definition. However, the Willamette River adjacent to the site is designated critical habitat for several listed salmonid species.

The ODEQ Level I Scoping ERA guidance requires that the U.S. Fish and Wildlife Service (USFWS) be contacted to establish the presence or potential presence of threatened and/or endangered species or their habitat in the locality of the facility. The USFWS does not respond to requests for information regarding listed threatened or endangered species that are not under federal authorization. Because this Level I Scoping ERA is not being conducted under federal authorization, the USFWS recommended contacting the Oregon Natural Heritage Program (ONHP) for the information. USFWS did, however, send a list of federally listed and proposed endangered and threatened species, candidate species, and species of concern that may occur in Multnomah County. ONHP conducted a search for rare, threatened, and endangered plant and animal records within a 2-mile radius of the site. Replies were received via fax from USFWS and ONHP and are presented in Appendix D.

The list sent by USFWS contained one listed mammal, two listed birds, ten listed fish, and six listed plants. The list also contained species that are proposed, candidate, and species of concern. None of these species were observed at the site during the site visit (see Section 3.4).

The ONHP database provided records of ten special status species that were documented within a 2-mile radius of the site and were state or federally listed as threatened, endangered, or candidates for listing. Records included four plant species, one turtle, four salmonids and one bird. However, all ten species were documented away from the immediate site vicinity and were not observed on the site during the site visit (see Section 3.4). Table 1 summarizes the USFWS and ONHP lists of special status species.

2.5 CONTAMINANTS OF INTEREST

Several investigations have been conducted at the site and at adjacent properties and are summarized in the RI Work Plan (KHM 2001). All contaminants identified at the site during historical investigations and associated with past practices at the site are considered contaminants of interest (COI). Locations of detectable concentrations of COI have been identified by KHM as part of the ongoing remedial investigation. COI and their detected locations are listed in Appendix A, Part 1. Sample locations are shown in Figure 3.

Based on the preliminary contaminant concentrations found on the site, contaminants of interest are present in several parts of the site. Surface soil samples were collected at depths of up to 3 feet below ground surface. Relative to other portions of the site, contaminant concentrations in surface soil are particularly high in the southwest corner of the property. The sample locations showing high contaminant concentrations include SS-1, SS-3, SS-6, SS-7, and SS-8, which show relatively higher levels of metals and PAHs in surficial soils. In addition, MW-13, a groundwater monitoring well on the northern portion of the property, exhibited high concentrations of total petroleum hydrocarbons (TPHs) and aromatic volatile organics (BTEX/N). Polychlorinated biphenyls (PCBs) related to electric transformer oil were suspected in surface soil near the electric building, but were not detected at sample location SS-25.

Subsurface soil samples were collected between 5.5 and 40 feet below ground surface. Relative to other portions of the site, the highest concentrations of contaminants in subsurface soils occur both toward the northern side of the property and along the east side of the property near the river. Sample locations on the north end of the property showing greater levels of TPHs, BTEX/N, volatile organic compounds (VOCs), and PAHs include MW-12, MW-17/HO-1, HO-2, and SP-4. Sample locations on the east side of the site, showing higher levels of VOCs and PAHs, include RF-1 and MW-10.

Table 1
Special Status Species that Occur or Potentially Occur

Common Name	Scientific Name	Federal Status	State Status	Agency List
Mammals				
Columbian white-tailed deer	<i>Odocoileus virginianus leucurus</i>	E	-	USFWS ¹
Birds				
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	-	USFWS
Northern spotted owl	<i>Strix occidentalis caurina</i>	CH T	-	USFWS
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	C	SC	ONHP ²
Reptiles				
Painted turtle	<i>Chrysemys picta</i>	-	SC	ONHP
Fish				
Bull trout (Columbia River population)	<i>Salvelinus confluentus</i>	T	-	USFWS
Chinook salmon (Lower Columbia River)	<i>Oncorhynchus tshawytscha</i>	T	SC (fall run)	USFWS, ONHP
Chinook salmon (Upper Willamette River)	<i>Oncorhynchus tshawytscha</i>	T	-	USFWS
Chinook salmon (Spring/summer/fall runs in the Snake River)	<i>Oncorhynchus tshawytscha</i>	CH T	-	USFWS
Chum salmon (Lower Columbia River)	<i>Oncorhynchus keta</i>	T	-	USFWS
Coho salmon (Lower Columbia River/SW Washington Coast)	<i>Oncorhynchus kisutch</i>	C	E	ONHP
Steelhead (Middle Columbia River)	<i>Oncorhynchus mykiss</i>	T	-	USFWS
Steelhead (Upper Willamette River)	<i>Oncorhynchus mykiss</i>	T	-	USFWS
Steelhead (Lower Columbia River)	<i>Oncorhynchus mykiss</i>	T	SC	USFWS, ONHP
Steelhead (Snake River Basin)	<i>Oncorhynchus mykiss</i>	T	-	USFWS
Sockeye salmon (Salmon River tributary to the Snake River)	<i>Oncorhynchus nerka</i>	CH E	-	USFWS
Plants				
Bradshaw's lomatium	<i>Lomatium bradshawii</i>	E	-	USFWS
Columbia water-meal	<i>Wolffia columbiana</i>	-	-	ONHP
Golden paintbrush	<i>Castilleja levisecta</i>	T	-	USFWS
Howellia	<i>Howellia aquatilis</i>	T	-	USFWS, ONHP
Kincaid's lupine	<i>Lupinus sulphureus</i> var. <i>kincaidii</i>	T	-	USFWS
Nelson's checker-mallow	<i>Sidalcea nelsoniana</i>	T	-	USFWS
Oregon sullivantia	<i>Sullivantia oregana</i>	SOC	C	ONHP
Tall bugbane	<i>Cimicifuga elata</i>	-	C	ONHP
Willamette daisy	<i>Erigeron decumbens</i> var. <i>decumbens</i>	E	-	USFWS

Notes: E = Listed Endangered, T = Listed Threatened, CH = Critical Habitat has been designated for this species, SOC = Species of Concern, SC = Sensitive-critical.

¹ USFWS provided a list entitled "Federally Listed and Proposed Endangered and Threatened Species, Candidate Species and Species of Concern That May Occur in Multnomah County." Only Federally Listed species are presented in this table.

² ONHP provided a list of Federally and State listed species known to occur within 2 miles of the site. All species on the ONHP list are presented in this table.

SECTION TWO

Assessment of Existing Data

Groundwater elevations at sampling locations ranged from 72.16 to 83.36 feet relative to the City of Portland datum. Relative to other portions of the site, groundwater contaminant concentrations are highest around both the southeast corner of the property and the northwest and west portions of the site. Groundwater monitoring wells in the southeast corner exhibiting higher relative concentrations of TPHs, BTEX/N, VOCs, PAHs, and metals include MW-8, MW-9, and MW-10. Also, a near-shore groundwater sample designated SEEP-2 exhibited higher levels of PAHs. Groundwater monitoring wells in the northwest and west portions of the site showing higher levels of TPHs, BTEX/N, VOCs, and metals include MW-13, MW-6, MW-15, and MW-16 (which is located near the rail car loading rack).

Additionally, the site lies adjacent to the approximate 8-mile stretch of the Willamette River that was designated as a federal Superfund site in 2000 due to the presence of contaminants in river sediments and associated upland sites.

Detected concentrations of hazardous substances are found in surface soils, subsurface soils, groundwater, and sediment on the site. KHM is currently studying the extent of migration of these hazardous substances. The direction of groundwater flow is generally toward the Willamette River and flows about 400 feet per year; therefore, contaminants within the groundwater will likely migrate toward the river. Wind action may transport dust from contaminated surface soils throughout the area. Migration of contaminants from the site to adjacent properties or the Willamette River could result in ecological receptor exposure.

3.0 SITE VISIT SUMMARY

Two URS environmental specialists visited the site on March 13, 2002. The weather was overcast with occasional rain and light wind. Photographs taken during the site visit are presented in Appendix C.

A walk-through of the site was led by a KMLT representative and a consultant from KHM Environmental Management. Observations of site characteristics (e.g. locations of tanks and other structures, extent of the property, localized odors, locations of wildlife species and site vegetation, etc.) were recorded in a field notebook. The 16.1 acre site is estimated to be 90 percent developed with little or no habitat. Approximately 10 percent of the site consists of a vacant lot, which also lacked significant habitat.

3.1 OBSERVED IMPACTS

Observed impacts are summarized in Appendix A, Part 2.

The northern third of the site is paved with concrete and the tank yards are surfaced with gravel. As a result, most of the site is not vegetated and currently does not provide ecological habitat. The perimeter is entirely fenced, preventing access for most ground-based wildlife species. However, rodents such as the Norway rat, which are associated with disturbed habitats, may occur on the site.

The facility lies on the west bank of the Willamette River. Water quality may be affected by surface or stormwater runoff directed into the river. Oil-water separators are used, however, and the owners of the site hold an NPDES permit to discharge wastewater into the Willamette River.

No direct ecological effects from the chemicals of interest were observed.

3.2 ECOLOGICAL FEATURES

Ecological features are itemized in Appendix A, Part 3 and are depicted in Figure 4.

As indicated in Section 3.2 (above), most of the site is paved or surfaced with gravel, or contains buildings and tanks, and therefore provides extremely limited ecological habitat. Sparse vegetation, including grasses and shrubs between 2 and 5 feet tall, was observed on the bank of the river and along the site boundary. A few individual deciduous trees were located at the southeast corner of the property, along with some invasive vegetation such as Himalayan blackberry. At the time of the site visit, no wildlife species were observed on the site, with the exception of birds such as swallows and gulls flying overhead. Migratory birds pass over the site, but would have little or no exposure to site contaminants. Burrowing mammals may access the site in places of bare soil along the perimeter at the north and south ends of the property, and some small mammals may gain access through the fence. However, no small mammals were observed on the site during the reconnaissance, and no evidence of burrowing was observed.

The scrub-shrub and sparse deciduous riparian forest areas on the properties located north and south of the site may provide some ecological habitat adjacent to the facility. Birds were observed flying among stands of deciduous trees on the adjacent property north of the site.

In addition, the Willamette River adjacent to the site is designated as critical habitat for several salmonid species. The river also provides habitat for other fish species, amphibians, aquatic mammals, and a variety of water-associated birds.

3.3 ECOLOGICALLY IMPORTANT SPECIES AND HABITATS

No ecologically important species were observed during the site visit as discussed in Appendix A, Part 4. However, the areas of riparian forest on the properties both north and south of the site may provide habitat for special status species such as the yellow-billed cuckoo, a state species of concern documented by ONHP as occurring within 2 miles of the site. The cuckoo breeds in parks, riparian woodlands, thickets, and open woodlands with dense undergrowth (Ehrlich et al. 1988; Sibley 2000). However, some studies have suggested that this species requires patches of suitable habitat larger than 35 acres (Csuti et al. 1997). Consequently, this species is unlikely to occur in the vicinity of the site.

The scrub-shrub area along the roadway and railroad and on properties adjacent to the site could potentially provide habitat for Nelson's checker-mallow, a federally threatened plant species identified by USFWS as potentially occurring in Multnomah County. This species grows in gravelly, well-drained soil and is found primarily where remnant patches of native grassland species occur such as along fencerows, roadsides, and old cemeteries (Meinke 1981). In many cases this habitat persists in small patches along roadside ditches, where mowing is difficult or impossible. However, this species is very unlikely to occur due to the very limited quantity of potentially suitable habitat on the site.

The bald eagle is included on the USFWS list as a federally threatened species that occurs in Multnomah County. Several bald eagle nests are located near the site. The closest recorded nest site is located in the Tualatin Mountains, approximately 3.5 miles (5.6 km) northwest of the site and above the community of Burlington. Another nest is located near Belle Vue Point on Sauvie Island, approximately 3.5 miles (5.6 km) northeast of the site (Isaacs and Anthony 2000). The size of the bald eagle's home range is between 1,700 and 15,800 acres (USEPA 1993), depending on the citation quoted and the area within North America studied. A study of bald eagle home range performed in the San Juan Islands of Washington State estimated the home range of this species to be 2,372 acres. The bald eagle may forage up to seven kilometers from the nest (Stalmaster 1987, Craig et al. 1988). This species may potentially forage on fish in the Willamette River near the site, but the site is at the far end of the published foraging range for this species, and there is no source of potential prey on the site.

Several salmonid species are included on the USFWS list as federally threatened, proposed, or candidate species that occur in the Willamette River, including Lower Columbia River steelhead (Threatened), Middle Columbia River steelhead (Threatened), Upper Willamette River steelhead

(Threatened), Lower Columbia River chinook salmon (Threatened), Upper Willamette River chinook salmon (Threatened), Lower Columbia River chum salmon (Threatened), Columbia River/SW Washington Coastal cutthroat trout (Proposed Threatened), and Lower Columbia River coho salmon (Candidate). Some fish species in the river may also be recreational and/or commercial resources. These species could potentially be exposed to contaminants migrating from the site via groundwater or surface water runoff.

4.0 CONCLUSIONS AND RECOMMENDATIONS

A Level I ERA is the initial step in determining the potential for ecological receptors to become exposed to chemicals of interest. Based on the results of the Level I ERA performed by URS, several potential exposure pathways and ecological receptors are present within the locality of the facility.

The exposure pathways that may be present include the surface soil to air pathway, surface soil to surface water pathway, groundwater to surface water pathway, groundwater to sediment pathway and surface water to aquatic prey species pathway.

4.1 RECEPTOR-PATHWAY INTERACTIONS

The evaluation of receptor-pathway interactions is presented in Appendix B, and an ecological conceptual site model is provided in Figure 5. No receptor-pathway interactions are present on the site, but some may occur within the locality of the facility. The extremely limited quantity of ecological habitat on the site serves to minimize the extent of ecological receptor contact with site soils or fugitive dust. Although they may be potentially complete pathways, dermal contact with and ingestion of soil are likely to be ecologically insignificant exposure pathways.

Salmonids and other recreationally and/or commercially important fish species may be exposed to contaminants in surface water and sediment if contaminants migrate to the Willamette River. Based on the inferred local groundwater flow direction, the river is hydrogeologically downgradient from detected hazardous substances. Contaminants may migrate through groundwater to the sediment and ultimately to the surface water. Uncertainty associated with this pathway includes the degree of site-related contamination in the surface water and sediment and the degree of effectiveness of the seawall.

The bald eagle and salmonids may be exposed to contaminants that contact aquatic prey species if the contaminants migrate to the river and bioaccumulate in prey species. As discussed above, contaminants may migrate through groundwater to the sediment and ultimately the surface water, where prey species may be exposed. Uncertainty associated with this pathway includes the degree of site-related contamination in the surface water, sediment, and aquatic species, and in the diet of ecologically significant bird and fish species and the degree of effectiveness of the seawall. However, the known site contaminants are not chemicals which are considered to bioaccumulate, and do not biomagnify via trophic transfer, thus this pathway is not considered complete.

Birds may be exposed to contaminants through inhalation of fugitive dust and ingestion or dermal contact with surface soil and/or surface water while temporarily visiting the site. Uncertainty associated with this pathway includes the degree of contamination in the air and in water bodies on the site, the use of the site by ecologically important bird species, and the duration of contact with the site by receptors. Although potentially complete, this pathway likely has little ecological significance due to lack of habitat and limited site use by receptors.

There are no ecologically significant plant species on the site. However, plants on adjacent properties may be exposed to detected contaminants in the soil or shallow groundwater that may migrate from the site. Any detrimental effects to the plants as a result of soil or groundwater contamination may degrade habitat, which may in turn affect ecologically significant species that have the potential to occupy the habitat. Listed plants that have the potential to occupy the habitat on adjacent properties may also be exposed to contamination. Uncertainty associated with these pathways includes the degree of contamination in the soil in the vegetated area on adjacent properties. Although potentially complete, this pathway likely has little ecological significance due to the very limited quantity of potentially suitable habitat.

4.2 RECOMMENDATIONS

Potential ecological receptors at the site, as defined by ODEQ, are ecologically important birds, fish, and plants:

- Potentially suitable habitat is available within the locality of the facility, although not at the site itself, for the yellow-billed cuckoo, a state species of concern known to occur within two miles of the site.
- Potentially suitable habitat is available within the locality of the facility, although not at the site itself, for Nelson's checker-mallow, a federally listed species known to occur in Multnomah County.
- The bald eagle is a federally listed species that is known to occur within 3.5 miles of the site and may forage on or near the site.
- Several salmonid species that are federally listed and other fish species that may be considered recreationally or commercially important are known to be present in the Willamette River, which is adjacent to the site and is designated as critical habitat.

Because the first three issues are unlikely to be significant, a Level II ERA is unwarranted for terrestrial species within the locality of the facility. In a Level II screening ecological risk assessment, dermal contact and inhalation exposure pathways could not be quantitatively evaluated for terrestrial wildlife because there are no ecological toxicity reference values relating environmental media concentrations to adverse effects for these two exposure pathways. However, according to ODEQ Guidance for Ecological Risk Assessment Level I Scoping Task 6, the potential for a complete pathway exists for ecologically important aquatic species in the Willamette River. Evaluation of risks to aquatic species will be completed in accordance with the CERCLA program.

The evaluation of risks to aquatic species might show exposure pathways to ecological receptors as incomplete, or complete but insignificant (i.e. not leading to contaminant concentrations in surface water or sediment that would pose a risk to ecological receptors). If current and future activities at the site were shown to have no impact on important ecological species, an Endangered Species Act consultation for the site would not be necessary.

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FIGURES
